How Far Can U.S. Equity Prices Fall Under Asset and Debt Deflation

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1. INTRODUCTION

Equity prices have been falling since March 2000. How far can they fall before they reach bottom? The current bear market resembles the mid-1970s plunge in equity prices in magnitude. But it differs in terms of the causes, and consequently with respect to the factors that should be monitored to test its progress. In the 1970s, soaring inflation was the reason for the bear market due to the surge in the price of oil. It eroded households' real disposable income and corporate profits. That was a supply-led business cycle. Now, the bear market is caused by asset and debt deflation triggered by the burst of the "new economy" bubble.

There have been three episodes of an asset and debt deflation caused recession in the 19th and 20th centuries.[1] The Great Depression of 1876-90 (associated with the railway bubble), the depression of 1929-40 (associated with the electricity and automobile bubble) and the deflation of Japan that started in 1989 and has not yet finished (associated with electronics). The current asset and debt deflation is associated with the telecommunications and internet bubble. In all these cases the process of eliminating the serious imbalances associated with the burst of the bubble took a long time--over a decade. As the recent experience of Japan shows, in a secular bear market there are sharp, but short-lived rallies that give rise to false hopes of an end of the bear market. In an asset and debt deflation environment the non-bank private sector retrenches because as its huge debt, acquired in the rosy years of rising asset prices, is inconsistent with falling asset prices. The process of reducing debt through increased saving and decreased spending is causing a secular bear equity market. This is exactly what is happening in the U.S.

The 2001 recession was very mild, as it was caused by an inventory correction associated with the burst of the "new economy" bubble. Although with current economic fundamentals the Standard and Poor (S&P) index is fairly valued at 871, the fair value may fall if the economy has a double-dip recession that triggers a property market crash. We suggest that the U.S. economy is heading for such a recession, as the poor prospects of the corporate sector are affecting the real disposable income of the personal sector. The forces that drive the economy back to recession are related to imbalances in the corporate and personal sectors that have started infecting the balance sheet of the commercial banks. The final stage of the asset and debt deflation process involves a spiral between banks and non-bank private sector (personal and corporate). Banks cut lending to the non-bank private sector (a credit crunch), which worsens the economic health of the latter and is reflected subsequently as a further deterioration of the balance sheet of the banks.

The purpose of this paper is to examine at length the analytics of the interplay to which we have just alluded. We concentrate entirely on the U.S. economy. In the section that follows we revisit the question of how equities should be valued. In section 3 we discuss the possibility of a double-dip recession and of the property market crash. Equilibrium equity prices and the impact of a double-dip recession and the possible market crash are examined in section 4. A final section 5 summarizes and concludes.

2. HOW SHOULD EQUITIES BE VALUED

Since the current bear market has its roots in the asset and debt deflation process outlined above, traditional measures of equity market valuation are inappropriate, so different valuation techniques must be used. In this paper we look at the health of the personal sector balance sheet (the degree of imbalance) as a measure of equity market valuation.

Figure 1: Household Net Wealth

Legend:
— Household Net Worth as a % of Disposable Income
— Long Term Average Household Net Worth
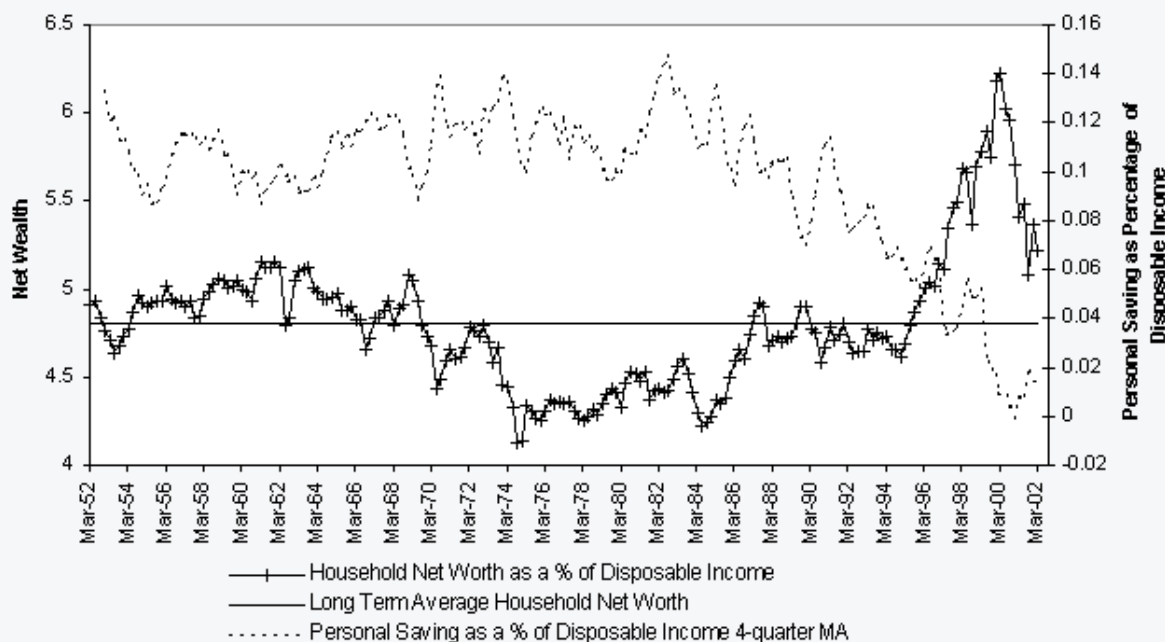------ Personal Saving as a % of Disposable Income 4-quarter MA

Figure 1 shows the net wealth of the personal sector as percent of its disposable income. Net wealth is defined as assets (both tangible and financial) less liabilities (consumer credit, mortgages, and other loans and advances from banks or finance houses). Net wealth, defined in this manner, provides a measure of the health of the personal sector balance sheet (its degree of imbalance). We may, thus, have:

$$(NW/YD) = (EQ/YD) + (P/YD) + (OTH/YD) - (L/YD) \qquad (1)$$

where (NW) is net wealth, (EQ) is equities, P is property, (OTH) is other net wealth (essentially bonds and money), L is liabilities, and YD is disposable income. In equation (1) all variables are measured as deviations from their means. It is interesting to note in terms of our argument that a cursory look at the Federal Reserve *Flow of Funds Accounts* (August, 2002) clearly reveals that (NW/YD) is 515 percent, which implies a value of (EQ/YD) of 305 percent, (P/YD) of 223 percent, (OTH/YD) of 90 percent, and (L/YD) at 103 percent. The dominance of the ratio (EQ/YD) in net wealth is overwhelming.

This measure of wealth has the property that it reverts back to its mean, as it is a stationary variable.[2] The deviation of net wealth from its mean is therefore a measure of the imbalance of the personal sector balance sheet and can be used to value equities. In the current environment of asset and debt deflation, this is by far a superior method to value equities than traditional methods that are based on supply-side factors.

Net wealth was higher than its mean during the demand-led business cycles of the 1950s and 1960s, but lower in the 1970s and the first half of the 1980s, which were supply- led business cycles associated with the two oil shocks of 1973-74 and 1979. Net wealth bottomed at the end of 1974 at 413 percent of disposable income, but did not start to recover before mid-1984 at 422 percent. From then on, however, it rose rapidly to 492 percent of disposable income, just one quarter prior to the crash of 1987. Net wealth was reduced to 468 percent in the October crash but it soon recouped those losses. However, the collapse of the property market in 1989 and the ensuing recession eroded net wealth to 461 percent by the end of 1994. From then on, however, the bubble of the "new economy" expanded with net wealth soaring to 622 percent in the first quarter of 2000. The bubble burst in March 2000 with the plunge of the Nasdaq and net wealth fell to 515 percent by the end of August, 2002.

Figure 1 also shows the ratio of personal savings (S) to (YD) on a 4-quarter moving average (MA) basis. In this paper we adopt the thesis taken in Frowen and Karakitsos (1996) that the personal sector has a targeted value of real wealth that is consistent with the life cycle hypothesis of saving in the long run. However, as asset prices rise more than anticipated, the personal sector finds that its target real wealth is more easily met, and therefore relaxes on its effort to save. Consequently, the savings ratio (saving as percent of disposable income) falls when real wealth is rising more strongly than anticipated and vice versa. Since asset prices move procyclically, this implies a negative relationship between real wealth (expressed as percent of disposable income) and the savings ratio. Figure 1 strongly supports this view. We may, thus, postulate that

$$(S/YD) = S(NW/YD) \qquad (2)$$

with $S_1 < 0$, i.e., the derivative of (S/YD) with respect to (NW/YD) is negative.

Furthermore, we may treat (OTH) as exogenous and hypothesise that

$(P/YD) = P(dYD/dt)$ 　　　　　(3)

with $P_1 > 0$, and

$(L/YD) = L(dYD/dt)$ 　　　　　(4)

with $L_1 > 0$, so that equation (1) is fully explained with the exception of the ratio (EQ/YD); we elaborate on this all-important variable in the following section.

Our preferred measure of valuing equities from a long-term perspective is to ask what should be the value of equities if net wealth were to return to its historical mean. This measure of valuing equities assumes that the whole adjustment of net wealth is borne by equities for any given level of disposable income. Through time, however, the fall in equity prices required to restore net wealth to its mean is diminishing, as disposable income rises. In other words, there is no real need for a plunge in equity prices. Even with unchanged prices, the imbalances will be eliminated in time and net wealth will be restored to its mean value through a gradual rise in disposable income. Unfortunately, equity prices never remain unchanged since they are dependent upon expected developments in the real economy. Hence, an imbalance is usually corrected through a fall in asset prices.
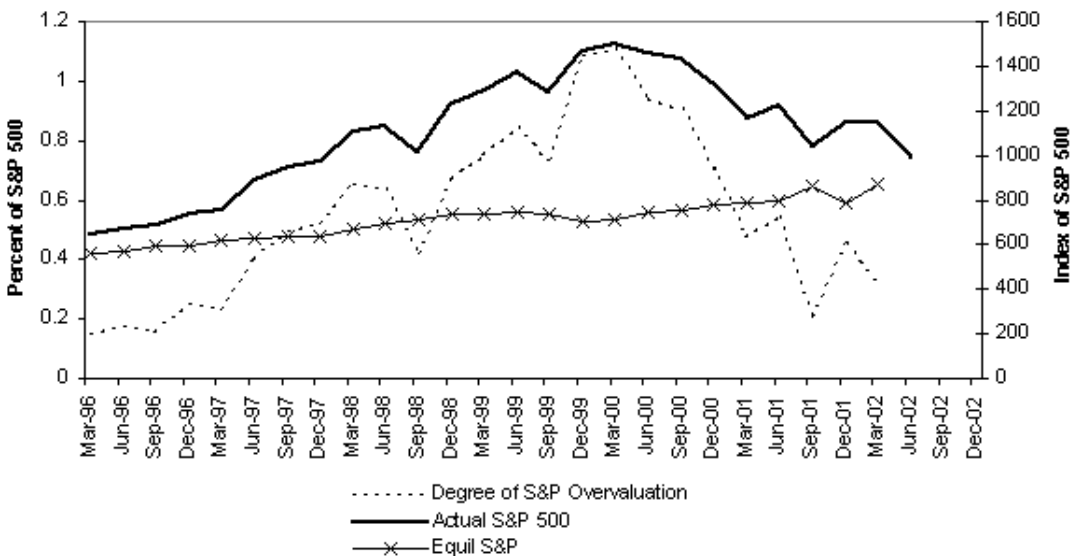

Figure 2: S&P Long Term Valuation

Figure 2 shows this measure of valuation for the S&P 500 during the main bubble years. The fair value increases through time as disposable income rises.[3] However, the pace of increase in asset prices was much faster than disposable income resulting in a bubble. At the peak of the bubble in March 2000, the S&P was 111 percent overvalued. In spite of two years of falling equity prices, at the end of the first quarter of 2002 the S&P was still 32 percent overvalued. Its fair value was 871. With the summer crash the S&P is now fairly valued. Does this herald the beginning of a new bull market? We assert that it does not. Although the market is fairly valued at the moment (end of 2002), it may not have fully taken account of likely developments in the economy over the next few years. In particular, the market consensus in the first half of 2002 was that the recovery would gather pace in the second half. The economy weakened in the second quarter, which contributed to the fall in equity prices between May and July 2002. The market has not lost faith in the recovery, it simply believes that it has been postponed until sometime next year.

3. DOUBLE-DIP RECESSION AND A PROPERTY MARKET CRASH

The current secular bear market has its roots in the burst of the "new economy" bubble that caused retrenchment by the personal and corporate sectors, which then affects the banking sector. Figure 3 shows the underlying forces of the personal sector imbalance. Whereas the ratio of financial assets and debt to disposable income (YD) fell from 520 percent of disposable income in March 2000 to 414 percent in the first quarter of 2002, debt has continued to soar to 103.5 percent of disposable income by the end of 2001, almost two years after the burst of the bubble. By the end of the first quarter of 2002, debt was only fractionally dented to 101.5 percent. Obviously, the discrepancy between falling financial wealth and soaring debt is due to the widely held belief that the fall in equity prices is temporary rather than permanent. This belief has been bolstered by a continuing rise in property prices that cushion the fall in equity prices.

Figure 3: Financial Assets and Debt of the Personal Sector

Financial Assets as % of Disposable Income
Total Debt as % of Disposable Income
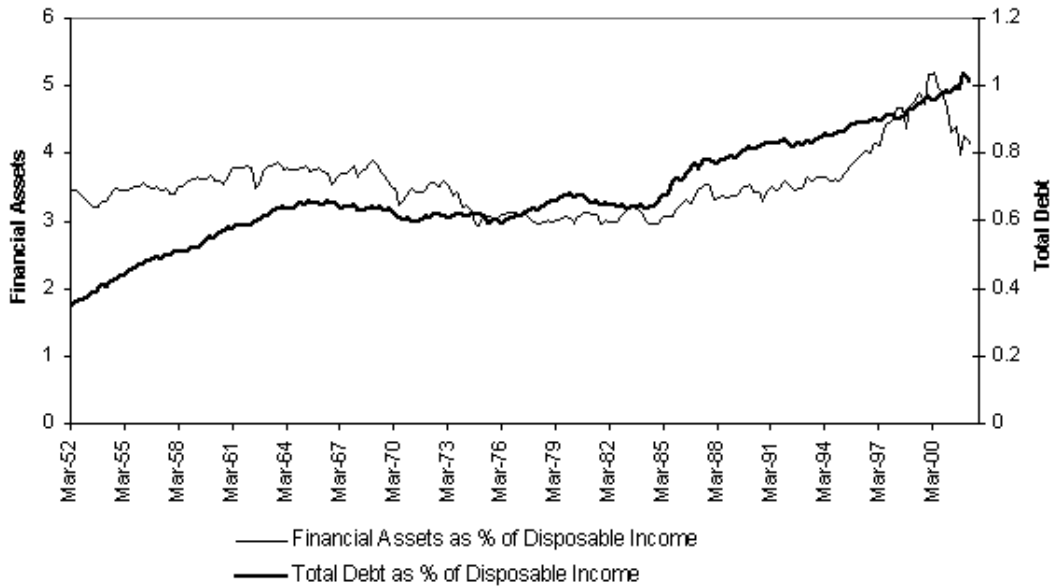
The adjustment of debt to sustainable levels consistent with the current level of asset prices will be a long and painful process of retrenchment with higher saving as percent of disposable income. Figure 1 shows that this process of a rising saving ratio triggered by falling net wealth has already started. The retrenchment by the personal and corporate sectors will ultimately plunge the economy into a double-dip recession. The market has not yet discounted the forthcoming recession, it has simply priced in the postponement of the recovery from the second half of 2002 to the first half of 2003. Disappointment with the lack of recovery will then trigger another collapse in equity prices later on, perhaps in the first half of 2003. The new recession will be much deeper than the last one, and there is a serious possibility of a collapse in the property market. Property prices recovered between 1994 and 2001 to 178 percent of disposable income. The likelihood of a substantial fall in property prices if the forthcoming recession turns out to be deep, is very high. The fall in property prices is usually caused by two factors: high and rising interest rates and falling and low growth in real disposable income. In most business cycles, the former is the cause of the latter. The central bank tightens monetary policy to curb inflation, which causes a recession that lowers real disposable income. Higher interest rates make it more difficult for households to service their debt, but they endure that until real disposable income begins to fall. Hence, the property market crash follows that of equities after a one or two years lag, as it takes time for the tight monetary policy to erode real disposable income growth. The equity market crash, on the other hand, occurs the moment investors perceive that the rise in interest rates will cause a recession. Moreover, the lag of the property market crash in relation to equities is due to portfolio shifting from equity to property after the crash in the former.

Figure 4 shows that the property market declines in every recession. The declines in property prices were small in the recessions of 1952 and 1958, but significant in the 1960 recession. Real estate as percent of disposable income fell 16 percentage points from 149 percent in December 1960 to 133 percent by March 1966. In the recession of 1973-75 the real estate component of net wealth fell 9 percentage points from 145 percent to 136 percent. In the recession of 1980-82 the real estate fell 14 percentage points from 167 percent to 153 percent of disposable income. However, in the 1990-91 recession the real estate fell much more-- from 179 percent of disposable income at the end of 1989 to 152 percent in December 1994. This represents a fall of 27 percentage points of disposable income compared with a 13 percentage points average in the other recessions.

Figure 4: Tangible Assets & Real Estate

Tangible Assets, Real Estate, % YD

— Tangible Assets as % of Disposable Income
— Real Estate as % of Disposable Income
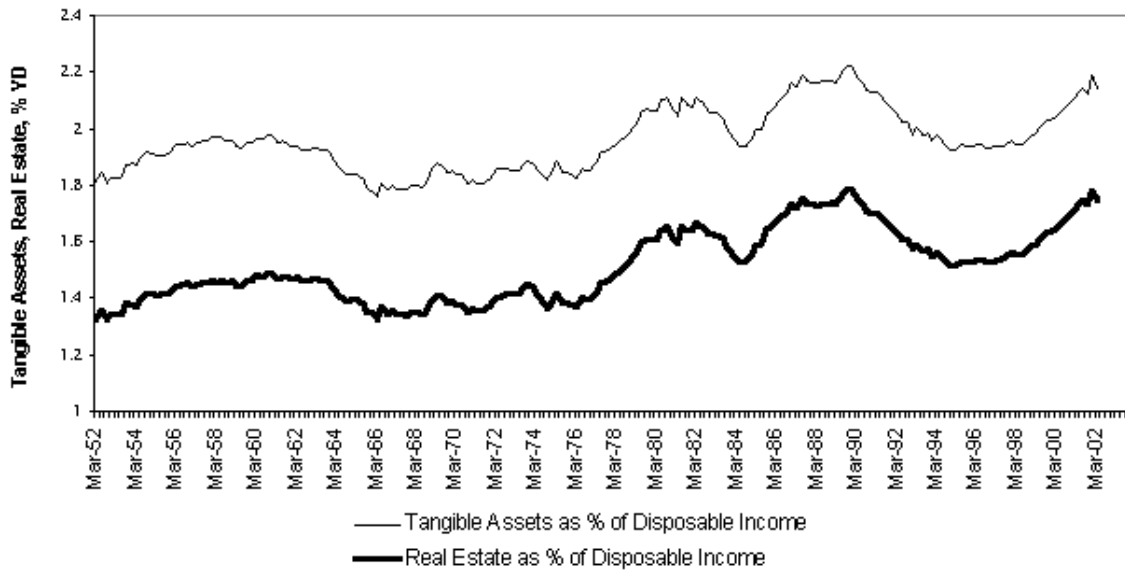
The 2001 recession differs from all the others in the post World War II era, in that it was not caused by monetary tightening, but by the excessive inventories that were built in the euphoria of the "new economy" bubble. In fact, interest rates have come down sharply, as U.S. monetary authorities did not simply react to the inventory correction, but correctly envisaged the risks from the asset and debt deflation process that was triggered with the collapse of Nasdaq in March 2000. Not only did lower interest rates increase the lag between equity and property market crash, but also fuelled the property bubble. The portfolio shift from equities to property has aggravated the property bubble. However, in spite of lower interest rates that cushions consumers servicing their debt, a substantial fall in real disposable income growth will trigger a collapse in property prices. The forthcoming recession, therefore, holds a high likelihood of a significant fall in property prices. Hence, the equity market may not yet have priced in the double effect of a deep and protracted recession with the simultaneous decline in property prices.

We may formalize these ideas as follows. We begin with

$$(EQ) = qQ \qquad (5)$$

where q is the price of equities, Q is the number of equities traded, and (EQ) as above. The aim is to determine q, and we may assume that

$$q = q[(RP), [\pi - E(\pi)]] \qquad (6)$$

where RP is the risk premium, π is profits, and E the expected value of the relevant variable.

Furthermore, RP may be determined by equation (7):

$$RP = R(YG, EER, CR, YC) \qquad (7)$$

where $YG = (R - DY)$, i.e., the yield gap (R is the long bond yield and DY is dividend yield); $EER = [(ES/P) - (R - P^e)]$, i.e., excess equity returns, with (ES/P) being the inverse of the price/earnings ratio (ES stands for earnings); $(R - P^e)$ the real rate of interest; CR credit risk (measured as the spread between Baa-rated corporate bonds with 10-year Treasuries); and $YC = (R - r)$, i.e., the yield curve, defined as the spread between the long bond yield and the 3-month Treasury bill rate (r).

Finally, profits follow the scheme as described by (8)

$$\Pi = \pi(IP, P^e, ER, INV, MS) \qquad (8)$$

where IP is industrial production, P^e is expected prices, ER is exchange rate, INV is investment and MS is the money supply (proxying liquidity).

The model we have just sketched is a summary of an economy-wide model developed and estimated in Karakitsos (2002). This model has been estimated using monthly data for the period 1988 (February) to 2002 (August). The computing package E-Views was used for estimation and simulation (see below) purposes.

4. THE LIKELY IMPACT ON EQUILIBRIUM EQUITY PRICES FROM A DOUBLE-DIP RECESSION AND A PROPERTY MARKET CRASH

In order to assess the likely impact of a significant fall in property prices caused by a double-dip recession on the equilibrium value of S&P 500, we have conducted a simulation exercise using the full macroeconomic and financial model described above. Three scenarios are simulated: (1) a severe property market crash with a deep recession; (2) a typical property crash with a relatively shallow recession; and (3) a mild double-dip recession with no property crash. The results of these simulations are summarized in Table 1.

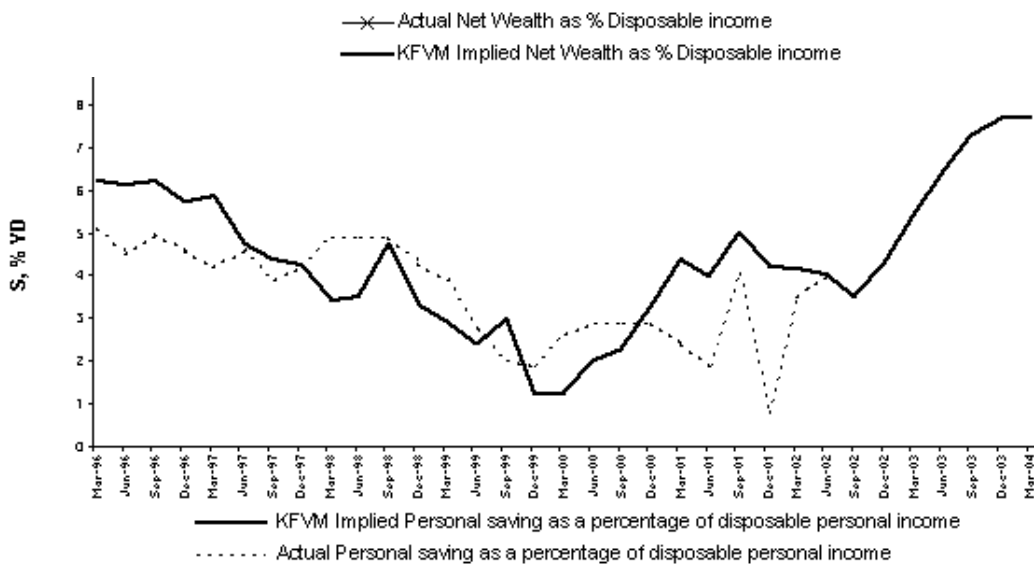**Scenario 1: Severe Property Market Crash and Deep Recession**
In the first scenario the real estate falls 35 percentage points from 175 percent to 140 percent of disposable income, 11 percentage points lower than its historical mean of 151 percent of the last 50 years, and of similar size to the 27 percent plunge in property prices in the first half of the 1990s. Our model suggests that as a result of this fall in property prices, net wealth will fall another 97 percentage points of disposable income, to 425 percent from its recent value of 522 percent within a year from the shock in property prices (see Figure 5). The fall in net wealth is a multiple of the initial plunge in property prices as it captures the effect of the latter on financial wealth. The fall of net wealth to 425 percent will bring it close to its all-time low in 1974.



Figure 5: Net Wealth as % of Disposable Income
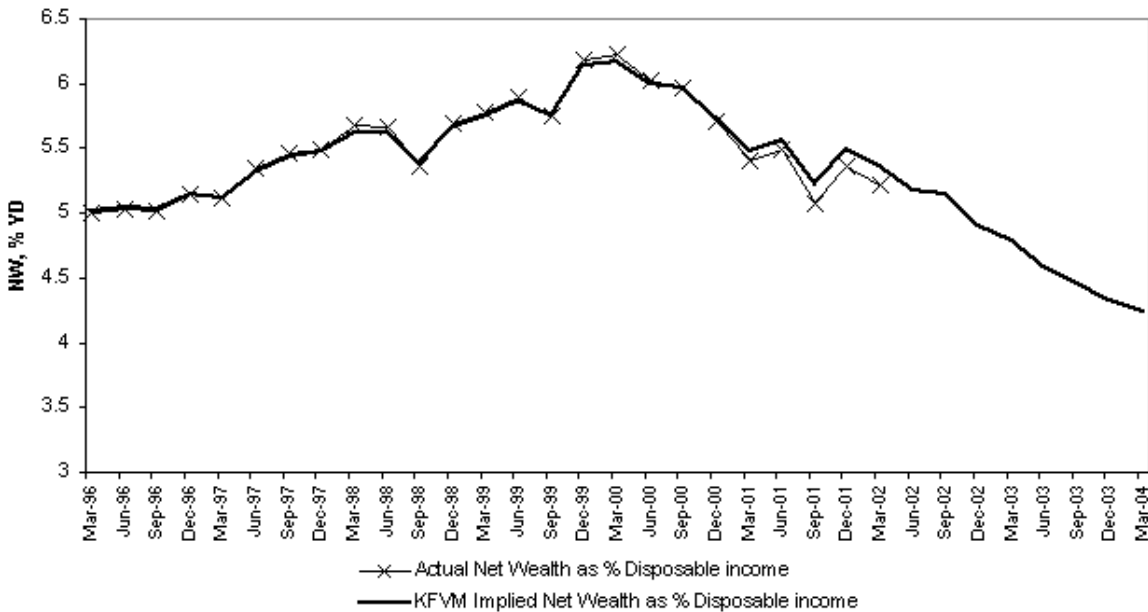
The decline in net wealth will trigger a rise in the saving ratio, as consumers lose hope of a recovery and realize that the fall in equity prices is permanent rather than temporary. Consumers will attempt to pay back their debt by saving more as percent of disposable income. Our model suggests that the saving ratio will rise to 7.7 percent one year from the shock in property prices (see Figure 6). The relationship between net wealth and the saving ratio is crucial in that it describes the way the balance sheet of the personal sector is brought back to equilibrium from a position of a serious imbalance.[4] Following our rationale of equation (2) we can argue that when net wealth rises above its mean value (desired volume of net wealth to disposable income) consumers realize that their desired volume of wealth is more easily met. As a result, they reduce their effort to save out of current income and the saving ratio falls. When net wealth falls below its mean value consumers know that the desired volume of their saving are unlikely to be met in the future. As a result they intensify their effort to save and the saving ratio rises. This negative relationship between net wealth and the saving ratio has been illustrated in Figure 1 and equation (2) above.

In the 1950s and 1960s when net wealth was higher than its average value the saving ratio fluctuated around its mean value of 8.1 percent. In the 1970s and the first half of the 1980s, when wealth was below its mean value the saving ratio fluctuated around its mean value of 9.9 percent. From the mid-1980s until 2000 the saving ratio fell around 12 percent, as net wealth rose. The saving ratio started to rise only a few months after net wealth peaked. The model prediction for a rise in the saving ratio to 7.7 percent in the case of a property market crash of the order of 25 percent is reasonable. In the early 1990s recession the saving ratio rose from 7 percent to 11.4 percent. The further increase in the saving ratio from its current level of 4 percent to 7.7 percent is almost of the same magnitude as in the early 1990s.

Actual Net Wealth as % Disposable income
KFVM Implied Net Wealth as % Disposable income

KFVM Implied Personal saving as a percentage of disposable personal income
Actual Personal saving as a percentage of disposable personal income

The rise in the saving ratio to 7.7 percent will deepen the recession, as the hitherto support to the economy from consumption will dissipate. The macro model suggests that the depth of the recession will be of the order of -2.5 percent of GDP. Industrial production will fall once more, reaching a bottom at -6 percent before it begins to recover. Investment in equipment and software will plunge once more, -10 percent, similar to its plunge in the 2001 recession (see Figure 7).[5] Corporate profits will fall once more to -20 percent at the depth of the recession. Such a fall in profits will be similar to the one experienced in the recession of 2001 (see Figure 8). The dollar will depreciate by 30 percent with its trade-weighted index falling to 70 from its current value of 100. The rate of growth of the money supply will decline to 6 percent, in spite of the huge injection of liquidity by the Federal Reserve, as the deteriorating balance sheet of the commercial banks will force them to cut lending (a credit crunch). Inflation will fall to zero. The price-earnings ratio will fall to its mean value of the last 20 years of 18.7, while the dividend yield will rise to its mean value of 3.2. Credit risk will remain at its current high level of 3.25 percent. The 10-year Treasury yield will fall to 3.1 percent. Under this scenario the S&P equilibrium value is 641.

Figure 7: Real Non-Residential Investment in Equipment & Software in the Last Busines Cycles
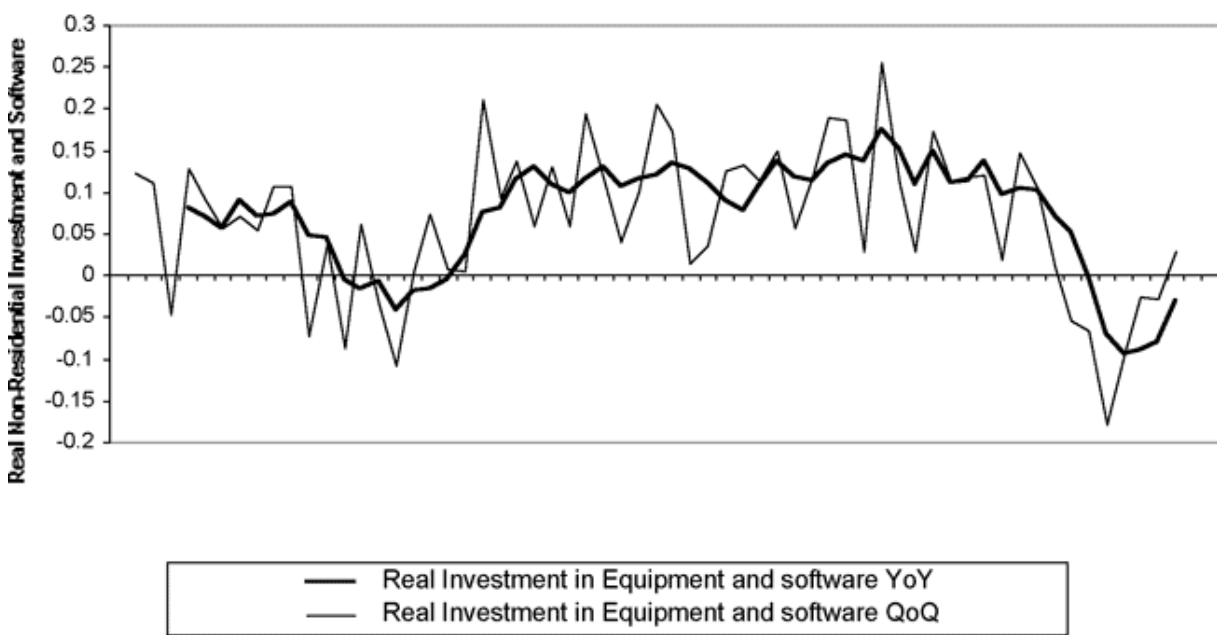
Real Investment in Equipment and software YoY
Real Investment in Equipment and software QoQ

| | Real Investment in Equipment and software YoY |
| | Real Investment in Equipment and software QoQ |
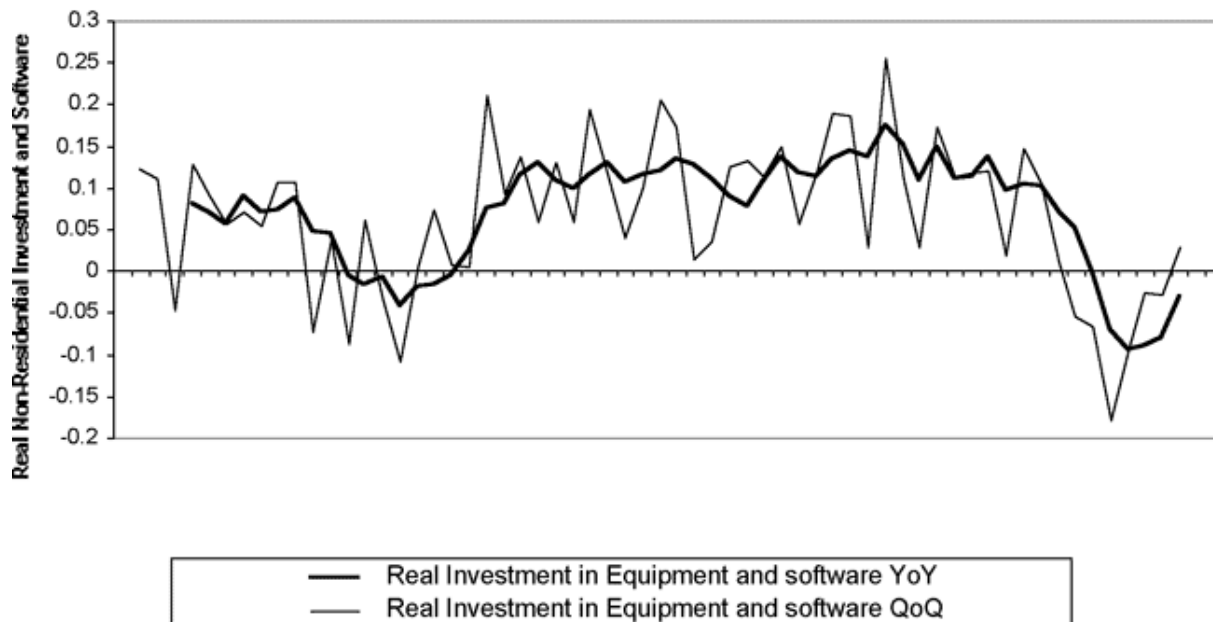
Sensitivity of Scenario I

The plausibility of the above scenario depends on how sensitive the equilibrium value of S&P is to its determinants. Table 1 provides the results of this sensitivity analysis. For comparison purposes every determinant has been perturbed by 50 percent of its value in the main scenario. Although a standardized perturbation in all determinants is necessary for comparison purposes, it may be implausible in some cases. Thus, some of the results of Table 1 may seem counterintuitive. For example, corporate profits have a smaller effect than the exchange rate. In order to appreciate the results of this sensitivity analysis it is useful to refer to certain aspects of the model summarized above.

In spite of the multitude of variables affecting the equilibrium value of S&P, these can be grouped into just two. Current (and expected) corporate profits and the equity risk premium. Actual corporate profits simply capture the effect of current profits on S&P. This effect is rather small. As the sensitivity analysis shows, a 50 percent improvement in current profits, from -20 percent to -10 percent, well within the normal range, lifts the equilibrium S&P by only 3.1 percent. The exchange rate, industrial production, investment, and inflation capture the effect of *expected* corporate profits on S&P, and this is, of course, more important than *current* profits. The exchange rate indirectly captures the effect of expected corporate profits. A fall in the dollar leads to higher S&P equilibrium value. Dollar depreciation leads to higher corporate profits, both in terms of repatriated profits for U.S. subsidiaries operating outside the U.S. It also leads to gains in competitiveness that produce higher exports and lower imports and, therefore, to higher profits for domestically producing U.S. companies.

The difference between the model and what the market believes at the moment (late 2002) is that the negative relationship between the exchange rate and the S&P equilibrium value reflects the partial derivative of the model (what would happen to S&P if the exchange rate depreciates, *other things being equal*) and the total derivative (what would happen if other variables are allowed to change *simultaneously*). In the main scenario a dollar depreciation of 30 percent is necessary for a recovery in corporate earnings. Such a huge depreciation may seem paradoxical, but it is necessary for a profit recovery). The market's view that a strong dollar is associated with a strong equity market stems from the relationship between equity market and GDP growth. A rally in the equity market raises the net wealth of the private sector and leads to higher growth in the economy through stronger consumption growth, which does not require dollar depreciation.

Similarly, the effect of industrial production on the S&P captures the effect of future corporate profits. An increase in industrial production leads to expectations of future rising profits and hence to higher S&P.

Higher inflation also leads to higher future corporate earnings by raising the pricing power of companies and by reducing the opportunity cost of holding equities, as higher inflation lowers the real interest rate-- the return on money--which is a substitute for equities. Also, an increase in investment on equipment and software leads to higher future corporate earnings by increasing the growth rate of the economy.

In sum, the effect of the exchange rate, industrial production, investment, and inflation approximates the effect of expected profits on the S&P. A rise in the equity risk premium, on the other hand, leads to lower equilibrium S&P. The equity risk premium is approximated in this model through the yield gap, excess equity return, credit risk, and the spread between the long bond yield and the 3-month Treasury bill rate. Credit risk is the most important determinant of the equity risk premium. A 50 percent fall in credit risk, from 3.2 percent to 1.6 percent, a very plausible magnitude in terms of actual fluctuations, will lead to almost 17 percent increase in the equilibrium S&P.

The results of the sensitivity analysis show that there are only three important factors that influence the equilibrium S&P: industrial production, the exchange rate, and credit risk. Even if it is assumed that industrial production will fall half as much as in the main scenario (-3 percent

instead of -6 percent, well within the normal range), the equilibrium S&P will improve only by 6 percent. A reasonable move in the currency is of the order of 10 percent. However, such a move will have a negligible effect on S&P. If the dollar were not to depreciate by 30 percent, but instead if it were to appreciate by 5 percent from its current value, the equilibrium S&P would be 20 percent lower, at 512. Hence, huge dollar depreciation is necessary for profitability and the economy to recover. On the other hand, a one percent fall in credit risk is well within the normal range. However, such a move will raise the equilibrium S&P 10 percent. In the main scenario, credit risk does not fall from its current level. It seems unreasonable that the economy will plunge into another recession, yet credit risk will abate. In the best case it will remain unchanged, but most probably it will rise, in which case the equilibrium S&P may be lower. The overall sensitivity analysis shows that the equilibrium S&P will be plus or minus 10 percent, around 640.

Scenario 2: A Typical Property Crash With A Relatively Shallow Recession

While sensitivity analysis is useful in showing the robustness of the main scenario with respect to its determinants, it is only a partial equilibrium analysis as it is based on partial rather than total derivatives. Alternative scenario analysis is complementary to sensitivity analysis because it is based on total derivatives. The alternative scenario of a typical property crash with shallow recession leads to an equilibrium S&P of 723, instead of 641 in the main scenario, which is almost 13 percent improvement. In this scenario the property market crash is of the order of 15 percent fall of disposable income. Such a drop in the real estate is typical of those observed in the 1960s, 1970s, and 1980s. In the 1980s the drop in property values was caused by high interest rates that made servicing mortgage debt very difficult. In the early 1990s recession, the drop in real estate was of the order of 27 percent of disposable income, similar to the one assumed in the main scenario. Scenario 2, therefore, can only be defended on the assumption that lower interest rates will cushion the property market crash. In this case net wealth will fall to 454 percent instead of 425 percent in the main scenario. The recession will be milder of the order of -2 percent of GDP, which is deeper than the early 1990s recession, but shallower than either the 1970s or 1980s recession. A critical factor in this scenario is that credit risk will fall by 0.5 percent compared with its current value. If this were not to materialize, the equilibrium S&P will fall to 689, instead of 723. This represents an improvement of only 7.5 percent compared with the main scenario.

Scenario 3: A Mild Double-Dip Recession With No Property Crash

In this scenario, the recession will be so mild that it will not cause a property market crash. The recession will be caused by the corporate sector weakness that leads to no investment recovery. The personal sector will suffer as its real disposable income weakens because of fewer jobs and lower wages. But the personal sector will not retrench because the effects of the mild recession will be offset by the lower interest rates. The recession is assumed to be half as deep as the early 1990s one, thus helping to avoid a property market crash. In this case the equilibrium S&P is 833, an improvement of 30 percent compared with the main scenario. Again, critical in this scenario is the assumption that credit risk will decline by 1 percent compared with the main scenario, and 0.5 percent compared with Scenario 1. If credit risk were to fall only 0.5 percent, instead of 1 percent, then S&P would fall to 794, an improvement of 24 percent compared with the main scenario. However, some of the beneficial effects of lower credit risk are negated by smaller dollar depreciation.

5. SUMMARY AND CONCLUSIONS

With current (end of 2002) economic fundamentals, the S&P 500 is fairly valued at 871. The summer plunge of the stock market has eliminated any remaining overvaluation that has persisted since the peak of the bubble in March 2000. However, the equity market may move lower during the next two years, as investors are hoping that the recovery that was expected to gather pace in the second half of this year has simply been postponed to the first half of 2003. The market has therefore not taken account of (priced in) the possibility of a double-dip recession, which, if deep, will lead to a property market crash with further ramifications for the equity market. The probability of a double-dip recession is high and not, as the consensus believes, a remote possibility. Although the economy has recovered from last year's recession, it lacks the foundations for the beginning of a new, long-lasting business cycle. None of the imbalances in the personal and corporate sectors have been eliminated during the last two years. Thus, after the brief recovery of the last nine months resulting from an inventory correction, the economy now has a non-negligible chance of plunging in another recession, one much deeper than last year.

How far can equity prices fall? In our main scenario the recession will trigger a severe property crash of the order of 25 percent, (the same magnitude as in the 1990s recession), which will deepen the initial recession to -2.5 percent of GDP. This is deeper than the 1990s recession, but a bit shallower than those experienced in the 1970s or 1980s. In this case, the equilibrium S&P is 641, which implies another 25 percent drop in equity prices over the next two years. This may look excessive, but is based on neutral, rather than pessimistic assumptions. The sensitivity analysis shows that the critical factors underlying these conclusions are the depth of the recession, the dollar, and credit risk. The dollar is assumed to depreciate by another 30 percent from its current value. If that did not materialize, then the fair value would drop to 512. Dollar depreciation is essential for profitability and the economy to recover. On the other hand, credit risk is assumed to remain unchanged at its current high level of 3.3 percent. This is reasonable, as it is hard to justify that credit risk will abate from current levels when the economy goes into another recession. If credit risk were to increase then the equilibrium S&P will be even lower. The sensitivity analysis shows that for reasonable values around those shown in Table 1, the fair value of S&P is plus or minus 10 percent of 641. If the property crash is milder of the order of 15 percent, which is similar to the average fall in the 1960s, 1970s, and 1980s, the recession will be shallower of the order of -2 percent of GDP. With the same dollar depreciation as in the main scenario of 30 percent and 0.5 percent fall in credit risk the fair value of S&P is 723. If, finally, the recession is very mild (on the order of -0.7 percent of GDP), the property market crash may be avoided. In this case the equilibrium S&P is 833. This assumes that the dollar will depreciate by only 15 percent from its current value and that credit risk will abate by 1 percent.

The overall conclusion is that the U.S. economy and, by implication, the world economy, may not have yet seen the worst in terms of the recent recession. We conclude that a double-dip recession not only is it not remote, but under certain conditions highly probable.

TABLE 1												
		Main Scenario	**Alternative Scenarios**		**Sensitivity of Main Scenario**							
	Current Values	Severe Property Crash (1990s style)	Typical Property Crash (1980s style)	Mild Double-Dip Recession	Industrial Production	Investment	Liquidity	Corporate Profits	Exchange Rate	Credit Risk	Bond Yield	Inflation
Real estate wealth as percent of disposable income	175	140	160									
Net wealth as percent of disposable income	522	425	454									
Saving as percent of disposable Income	4	7.7	7									
GDP YoY	2.1	-2.5	-2	-0.7								
Industrial production YoY	0.2	-6	-4.75	-2	-3							
Investment in equipment & software YoY	-3	-10	-3	-1		-5						
Liquidity-M2 YoY	8	6					3					
Corporate profits YoY	11.5	-20	-15	-10				-10				
Exchange rate (trade weighted)	100.4	70	70	85					105			
Credit risk	3.3	3.25	2.75	2.25						1.625		
10-year Treasury yield	4	3									4	
CPI inflation	1.5	0	0	1								1.5
Equilibrium S&P 500	**871**	**641**	**723**	**833**	**682**	**655**	**636**	**661**	**512**	**748**	**611**	**669**
Sensitivity of equilibrium S&P with respect to main scenario percent		12.8%	30.0%		6.4%	2.2%	-0.8%	3.1%	-20.1%	16.7%	-4.7%	4.4%

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NOTES

1. There were many recessions caused by asset and debt deflation throughout the 17th and 18th centuries. Most important of which were the tulipmania in the middle of the 17th century, and the Mississippi, and South Seas bubble of the early 18th century (see, for example, Garber 2000).
2. A variable is stationary if its mean and standard deviation are not time varying. Net wealth as percent of disposable income is a stationary variable, as it is the difference of two nonstationary variables of order one.
3. The degree of S&P overvaluation and the fair value are derived from the model utilized for the simulation purposes of the paper (Karakitsos 2002). It is worth noting that the fair value corresponds to the intertemporal equilibrium value of the S&P index.
4. The relationship between net wealth and the saving ratio describes the stationarity condition of the personal sector balance sheet.
5. In Figure 7, Figure 8 and Table 1, YoY and QoQ stand for year-to-year and quarter-to-quarter, respectively.